

单萜吲哚生物碱的仿生合成

刘建利

西北大学生命科学学院中药学系

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摘要 单萜吲哚生物碱因其骨架和官能团的丰富变化, 加上它们的生物活性, 多年来一直吸引着一代又一代的化学家对其进行结构和合成研究, 它们的共同生物合成前体strictosidine是由色胺和单萜昔secologanin缩合形成的。自从secologanin可以大量得到以后, 以它为原料沿着可能的生物合成路线合成天然生物碱即仿生合成就成为重要的研究领域。它对于理解和阐释生物碱的生物合成过程, 为提供天然来源极少的生物碱供药理试验及对促进有机合成化学的发展等都是有重要意义。这方面的研究也取得了许多重要进展, 成功合成了一些重要的单萜吲哚生物碱, 如育亨宾类、钩藤碱、异钩藤碱、卡得宾、利血平类似物、喜树碱等。

关键词 [单萜](#) [吲哚 P](#) [生物碱](#) [生物合成](#)

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Biogenetically Patterned Synthesis of Monoterpenoid Indole Alkaloids from Secologanin and Its Derivatives

Liu Jianli

Department of Chinese Materia Medica, Northwest Univeristy

Abstract The rich variety of functionality and skeleton among the thousands of indole alkaloids, combined with their pharmacological properties, has long intrigued and challenged generations of chemists, for both structure elucidation and synthesis. Eventually, all were found to have a common biogenetic origin from a single universal precursor, the glucoalkaloid strictosidine, formed by condensation of tryptamine with the monoterpenoid glucoside secologanin. Most indole alkaloids contain two structural elements: tryptamine and a C-9/C-10 unit derived from secologanin. They are classified into three basic structural types according to the arrangement of the C-9/C-10 skeleton to form the Corynanthe, Aspidosperma and Iboga types, typified by ajmalicine, vindoline and catharanthine, respectively. Ever since secologanin become available in large quantities, it has been exploited as the starting material in enantiospecific alkaloid synthesis for more than three decades. In general, the approach has been "biomimetic", following the key steps according to the similar mechanism that occur in nature (biosynthesis) or which are thought to occur (biogenesis); the term "biogenetic-type synthesis" is also used. It also could contribute to elucidation of some aspects of the biosynthesis of these alkaloids, as well as providing a means of obtaining large quantities for pharmacological purposes of those only isolated in minor amounts. This review focuses on biogenetic-patterned syntheses of monoterpenoid indole alkaloids from secologanin and its derivatives, for example, heteroyohimbines, yohimbines, oxindole alkaloids, antirrhine and its derivatives, aspidosperma alkaloid analogs, cadambine and camptothecin.

Key words [MONOTERPENES](#) [INDOLE P](#) [ALKALOID](#) [BIOSYNTHESIS](#)

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